

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
21 May 2004 (21.05.2004)

PCT

(10) International Publication Number
WO 2004/041962 A3

(51) International Patent Classification⁷: **C09K 11/06**,
H01L 51/30, H05B 33/14

(21) International Application Number:
PCT/CA2003/001696

(22) International Filing Date:
7 November 2003 (07.11.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/424,699 8 November 2002 (08.11.2002) US
60/439,811 14 January 2003 (14.01.2003) US

(71) Applicant (for all designated States except US): NA-
TIONAL RESEARCH COUNCIL OF CANADA
[CA/CA]; 1200 Montreal Road, Bldg. M-5S, Room
EG-12, Ottawa, Ontario K1A 0R6 (CA).

(72) Inventors; and

(75) Inventors/Applicants (for US only): LI, Yuning
[CN/CA]; #701-240 Brittany Drive, Ottawa, Ontario
K1K 0R7 (CA). DING, Jianfu [CA/CA]; Apt. 10,699

La Verendrye Drive, Gloucester, Ontario K1J 7X5 (CA).
DAY, Michael [CA/CA]; 994 Buckskin Way, Orleans,
Ontario K1C 2Y6 (CA). TAO, Ye [CA/CA]; 1671 Place
des Ravins, Ottawa, Ontario K1Ck 6H5 (CA). D'TORIO,
Marie [CA/CA]; 1954 Mulberry Crescent, Gloucester,
Ontario K1J 8J9 (CA).

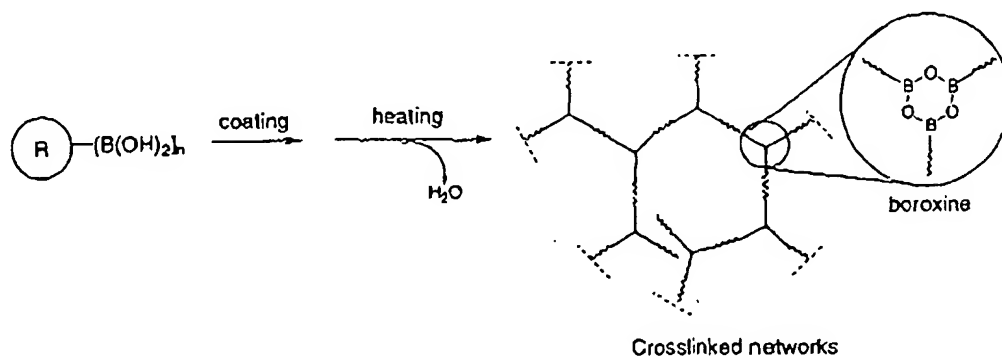
(74) Agent: ANDERSON, Wayne, J.; National Research
Council of Canada, Intellectual Property Services, EG-12,
Bldg. M-58, 1200 Montreal Road, Ottawa, Ontario K1A
0R6 (CA).

(81) Designated States (national): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR,
CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD,
GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR,
KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN,
MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU,
SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA,
UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (regional): ARIPO patent (BW, GH,
GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),
Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),

[Continued on next page]

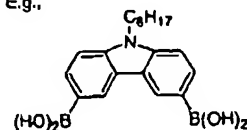
(54) Title: THERMALLY CROSSLINKABLE MATERIALS AND MULTI-LAYERED DEVICES THEREFROM



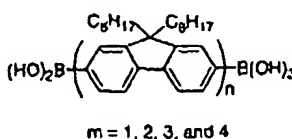
$n = \text{or} > 1$;

R = organic or organometallic complex moiety including oligomer and polymer.

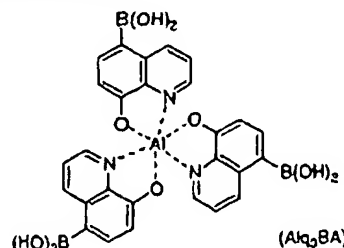
E.g.,



(CzBA)



(F_nBA)



(Alq₃BA)

(57) Abstract: The invention disclosed relates to cross-linkable composites of boronic acid or a boronic acid derivative such as a boronate, and an organic or organo-metallic moiety having a functionality such as hole transporting, electron transporting and light emitting, to cross-linked composites and to methods for making same. Multi-layer materials and optoelectronic devices including such cross-linked composites are also disclosed.

10/534087

JC06 Rec'd PCT/PTO 06 MAY 2005